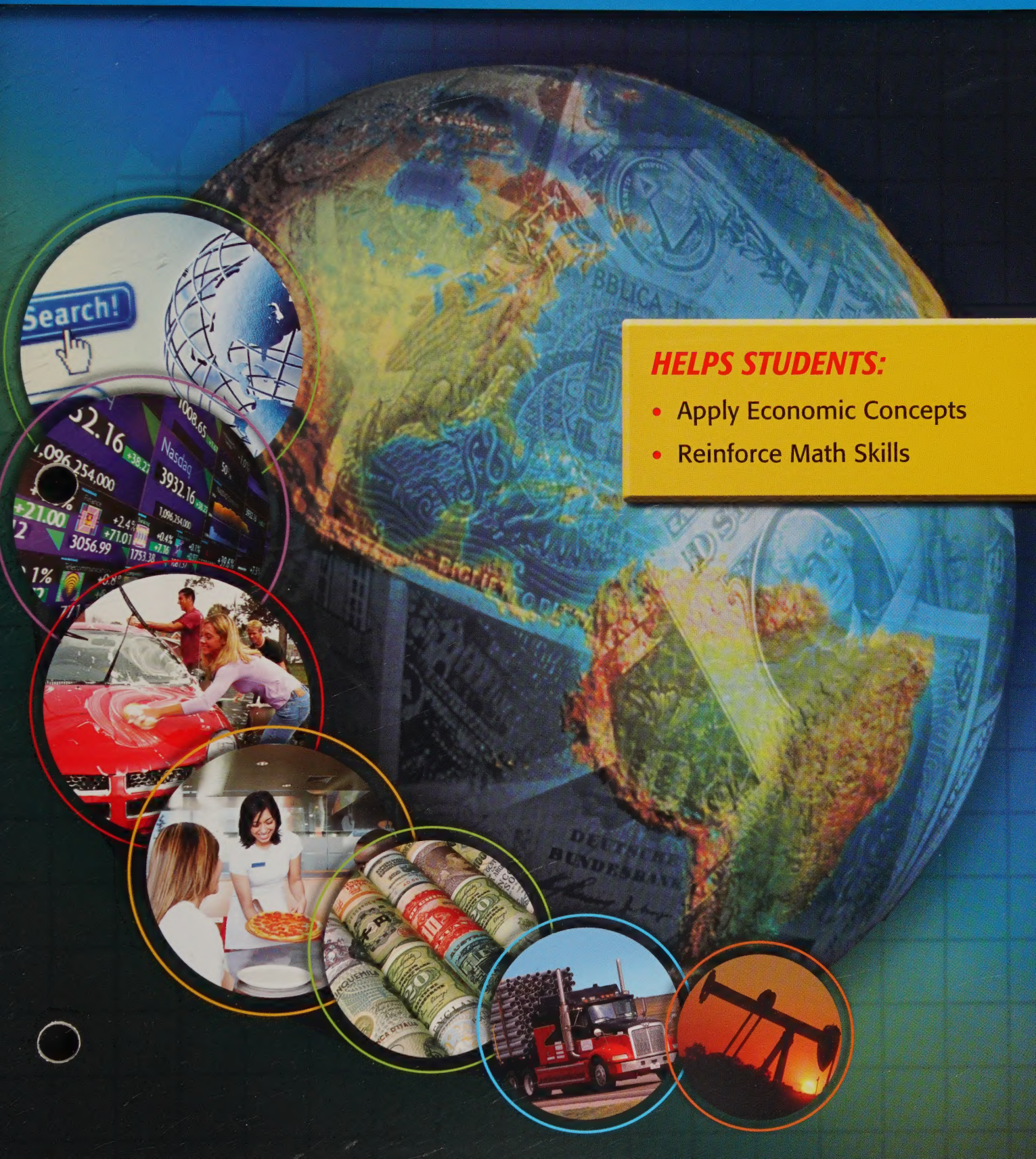
Math Practice for Economics



HELPS STUDENTS:

- Apply Economic Concepts
- Reinforce Math Skills

RUBY E. DARE LIBRARY
Greenville College
Greenville, Illinois 62246

MATH PRACTICE FOR ECONOMICS

Mc Graw Hill Glencoe

New York, New York Columbus, Ohio Chicago, Illinois Woodland Hills, California

TO THE TEACHER

Math Practice for Economics *provides activities to help students learn the math most commonly used in building and studying economic models. The activities supply real-life examples to prepare students to make viable decisions in their own financial lives. At least one math practice activity is provided for each chapter of the text.*

Answers to the Math Practice Activities can be found at the back of the booklet.

Mc Graw Hill Glencoe

The McGraw-Hill Companies

Copyright © by The McGraw-Hill Companies. All rights reserved. Permission is granted to reproduce the material contained herein on the condition that such material be reproduced only for classroom use; and be provided to students, teachers, and families without charge. Any other reproduction, for use or sale, is prohibited without prior written permission of the publisher.

Send all inquiries to:

Glencoe/McGraw-Hill
8787 Orion Place
Columbus, OH 43240

ISBN: 978-0-07-878061-5

MHID: 0-07-878061-6

Printed in the United States of America

1 2 3 4 5 6 7 8 9 10 047 10 09 08 07

CONTENTS

Activity 1	*Analyzing Trade-Offs*	1
Activity 2	*Making a Profit*	2
Activity 3	*Going Solo or Taking on Partners*	3
Activity 4	*Recognizing Demand and Elastic Demand*	4
Activity 5	*Applying the Law of Supply*	5
Activity 6	*Recognizing Factors that Affect Demand*	6
Activity 7	*Competing in the Marketplace*	7
Activity 8	*Comparing Prices Among Competitors*	8
Activity 9	*Handling a Checking Account*	9
Activity 10	*Figuring Finance Charges*	10
Activity 11	*Computing Housing Costs*	11
Activity 12	*Making Money with Your Money*	12
Activity 13	*Analyzing a Paycheck*	13
Activity 14	*Paying Taxes*	14
Activity 15	*Evaluating Increases in Federal Spending*	15
Activity 16	*Choosing a Financial Institution*	16
Activity 17	*Analyzing Investment Trends*	17
Activity 18	*Planning for the Future*	18
Activity 19	*Figuring Inflation's Effects*	19
Activity 20	*Creating Money*	20
Activity 21	*Achieving Economic Stability*	21
Activity 22	*Working with Foreign Exchange Rates*	22
Activity 23	*Converging Economic Systems: A Russian Case Study*	23
Activity 24	*Computing Per Capita Gross Domestic Product (GDP)*	24
Activity 25	*Predicting World Food Supplies*	25
Activity 26	*Investing in Global Markets*	26
Answer Key		27

Name _____ Date _____ Class _____

MATH PRACTICE FOR ECONOMICS ACTIVITY 1

ANALYZING TRADE-OFFS

When making an economic decision, you need to be aware of all the costs involved. Suppose you need to buy a car to get back and forth to work. Your choices are:

A. *A new subcompact costing $13,000,*

B. *A five-year-old car with 60,000 miles for $5,000, or*

C. *An old junker with 150,000 miles for $800.*

Which one should you choose? Complete the following exercises to find the initial costs and the yearly costs of owning each car for four years.

INITIAL COSTS

Some initial expenses of owning a car must be paid in cash. Typical costs for these items are shown in table 1.

1. Complete the table below. Use the car costs above and a sales tax rate of 5 percent.

Initial Expense	Cost for Car A	Cost for Car B	Cost for Car C
a. Title and registration	$100	$100	$100
b. Sales tax (Cost of car times 0.05)	$13,000 × 0.05 = $650		
c. 3 months of insurance	$350	$250	$220
d. Total initial cash costs	$1,100		

2. Assume that you have saved $2,000 for the purchase. How much of this money will you be able to put towards the purchase price of each car?

Car A: _____ Car B: _____ Car C: _____

3. For cars A and B you will need to take out a loan. Find how much you need to borrow for each car.

a. Loan for car A: _____ **b.** Loan for car B: _____

YEARLY COSTS

4. Annual costs for a 4-year loan at 10 percent will be about $30 for each $100 borrowed (30/100 × amount borrowed × 4). How much are the approximate total costs (4-year loan, plus downpayment, plus initial costs) for each car?

_____

5. Assume that at the end of four years, Car A is worth $7,000, Car B is worth $1,000, and Car C is junk, having cost $3,000 in extra repairs. Calculate your total costs by subtracting the value of Cars A and B from your costs and adding $3,000 to C. Which car would you choose? Why?

_____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

MATH PRACTICE FOR ECONOMICS ACTIVITY 2

MAKING A PROFIT

You and two of your friends are planning to run a concession stand at the park from Memorial Day to Labor Day. The three of you will share the work and the profits for the summer. The question is: Will there be any profits?

You are going to sell soda, lemonade, peanuts, and popcorn. You have a good idea of how much you will be able to sell because you have talked to the people who ran the stand the previous summer. You estimate that you can sell at least 200 sodas, 100 cups of lemonade, 50 bags of peanuts, and 300 bags of popcorn every week. You are going to charge 75¢ for soda, 50¢ for lemonade, $1 for peanuts, and 55¢ for popcorn.

Directions: *Follow these five steps to calculate your profits.*

Step 1: Figure below the amount of money you can expect to take in for one week.

Soda	$.75 × 200	=	**(1)** _____
Lemonade	$_____ × _____	=	**(2)** _____
Peanuts	$_____ × _____	=	**(3)** _____
Popcorn	$_____ × _____	=	**(4)** _____
	One Week's Revenue		**(5)** _____

Step 2: Now use the figure for the week to compute your expected revenue for the summer (14 weeks).

(6) _____

Does this figure represent your profits for the summer? **(7)** _____

Unfortunately, you will not just be taking in money. You will be paying out money for the food you will sell and to rent the stand. Most other businesses have many other expenses, including labor. Since you and your friends will work the stand yourselves, you will not have any labor costs. Your costs are just for food and rent.

You find out that it will cost $560 to rent the stand for the summer. You can buy a week's worth of soda for $90, lemonade for $25, peanuts for $50, and popcorn for $65. What will your costs for the summer be?

Step 3: Do your computations below:

Soda	$_____ × _____	=	**(8)** _____
Lemonade	$_____ × _____	=	**(9)** _____
Peanuts	$_____ × _____	=	**(10)** _____
Popcorn	$_____ × _____	=	**(11)** _____
Rent		=	**(12)** _____
	Total Costs		**(13)** _____

Step 4: Now that you have a reasonable estimate of both your total revenue and your total costs for the summer, use the following equation to project what your profits for the summer will be:

Revenue	**—**	**Costs**	**=**	**Profit**
(14) _____	—	_____	=	_____

Step 5: Do not forget that the profits have to be split three ways. What will be your share of the summer's profits?

(15) _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

MATH PRACTICE FOR ECONOMICS ACTIVITY 3

GOING SOLO OR TAKING ON PARTNERS?

If you go into business for yourself, all the profits are yours as well as all the costs. If you work with partners, you share the costs and together you may take in more money, but you usually also share the profits.

Directions: *Use the two tables to compare profit scenarios.*

Step 1: Figure your share of the profits in the three business arrangements below: working alone as a sole proprietor, working with one partner, and working with two partners.

	Alone (1 person)	With 1 partner (2 people)	With 2 partners (3 people)
REVENUE	$1,139	$1,523	$2,068
− Costs	−607	−792	−1,004
= Profit **(1)**			
÷ Number of people	÷1	÷2	÷3
= Your share of profit **(2)**			

Assume that you mow lawns. If you charge $15 per lawn and find four people to pay you to mow their lawns once a week for 11 weeks, how much would you take in?

Now consider your costs. To get started you spent $258 on a lawnmower. You have to pay about $8 a week on gas. What would your total cost for gas be for 11 weeks?

Suppose you take on one or two partners who also each know four people who want their lawns mowed. How would this affect revenue, costs, and profits?

Step 2: Fill in the amounts below to figure and compare your revenue, costs, and profits as a sole proprietor to your revenue, costs, and profits working with one or two partners.

	Alone (1 person)	With 1 partner (2 people)	With 2 partners (3 people)
REVENUE ($15 × 4 × 11 × number of people) **(3)**			
− Mower cost **(4)**	−	−	−
= Subtotal **(5)**			
− Gas Cost ($8 × 11 × number of people) **(6)**	−	−	−
= Profit **(7)**			
÷ Number of people **(8)**	÷	÷	÷
= Your share of profit **(9)**			

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

RECOGNIZING DEMAND AND ELASTIC DEMAND

Demand *is the desire, ability, and willingness to pay for goods or services. You will find examples of demand almost everywhere you look in your community.*

Directions: *Answer the following questions.*

Take this example: A retired couple who love to bowl open a bowling alley. It is the only place to bowl in town. When they first open, they charge only $2 a game, including shoe rental. About 60 people a day come to bowl there. At the end of each day the owners figure their total receipts using this formula.

Total Receipts = Price of the Product × Quantity Sold

What are their total receipts on an average day? **(1)** _____

The couple raises the price to $3 a game after a while, and they still get in about 60 people a day to bowl. Their total receipts on an average day now are **(2)** _____

What is the difference between their total receipts now and their receipts when they first opened?

(3) _____

Did demand increase, decrease, or stay the same? **(4)** _____

They decide to raise the price to $5 a game. Only about 35 people a day come in. Their total receipts a day are now about **(5)** _____. How does this compare with their receipts at $3 a game?

(6) _____ What happened to demand this time?

(7) _____

On the long February weekend for "Presidents' Day," the couple ran a special with games at $1. What a turnout! People were lined up waiting for lanes! After the weekend the management counted up the receipts and found that over the three days, 618 people had come in. The total receipts for one day average **(8)** _____ _____ What effect did the special offer for Presidents' Day have on demand?

(9) _____

You may recall that if a change in price causes a relatively larger change in quantity demanded, demand is elastic. All in all, would you say that demand for bowling in this town was elastic? **(10)** _____

The couple made a chart of their total receipts at different prices to analyze demand for their product. Fill in the chart below for each price as they did.

Price per Game (11)	×	Number of Games Played (12)	=	Total Receipts (13)

At what price did the management take in the most money? **(14)** _____

Remember, receipts are not profits. They are revenue. To calculate profit, you must subtract costs from revenue. Now consider these questions. Do you think the couple had to pay employees overtime during the Presidents' Day special? **(15)** _____ If they did, would that affect demand? **(16)** _____ Would it affect total receipts? **(17)** _____ Would it affect the couple's profit? **(18)** _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

MATH PRACTICE FOR ECONOMICS ACTIVITY 5

APPLYING THE LAW OF SUPPLY

The Law of Supply states that the quantity supplied *varies directly* with its price. *Varies directly* means that when one variable gets larger, the other variable gets larger, as in the equation $y = 3x$: when $x = 1$, $y = 3$; when $x = 2$, $y = 6$; when $x = 3$, $y = 9$; when $x = 4$, $y = 12$; and so on.

Directions: *Answer the following questions.*

Varies directly can also mean that when one variable gets smaller, the other variable gets smaller, as in $y = x/2$: when $x = 10$, $y =$ **(1)** _____; when $x = 6$, $y =$ **(2)** _____; and when $x = 2$, y = **(3)** _____.

Variables are things that change. The variables to consider in the Law of Supply are quantity and price. If the quantity supplied varies directly with the price, an increase in price will mean a corresponding increase in quantity supplied.

Supply is easier to understand if you take the point of view of the supplier. Imagine that you supply labor. If someone offers you $10 an hour for tutoring after school, you are more likely to want to work more hours than if they offered you only $2 an hour.

Compare the two situations. How many hours would you have to tutor at $2 an hour to equal the pay you would get for 4 hours at $10 an hour? **(4)** _____

The truth is that though you might not feel like giving up 20 hours a week at $2 an hour for a total of **(5)** $ _____, you might gladly give up 20 hours a week at $10 an hour for a total of **(6)** $ _____.

Now *you* think about it. How many hours would *you* be willing to spend a week tutoring at $2 an hour? In your opinion: **(7)** _____ At $10 an hour? In your opinion: **(8)** _____

There are other factors that affect supply. Imagine that you have an outlet for the beaded earrings you make. Each pair of earrings costs you $1 in supplies and takes about 2 hours to make. If you work 10 hours a week, you make **(9)** _____ pairs at a cost of **(10)** _____. If you sell each pair for $5, your profit is **(11)** _____.

Soon you get an offer to sell your earrings at $10 a pair, so you work 14 hours a week. You make **(12)**_____ pairs and a profit of **(13)** _____.

One day you discover a cheaper source for your wire and beads, so the cost of making the earrings drops $.25 a pair. Since you are now making a profit of **(14)** _____ on each pair, you are inspired to work more hours. You put in 18 hours, making **(15)** _____ pairs. Your total profit is **(16)** _____. This is an example of how a change in the cost of input (wire and beads) causes a change in supply.

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

RECOGNIZING FACTORS THAT AFFECT DEMAND

The buying decisions that you, your friends, and your family make on a daily basis often follow the same patterns as predicted by economic principles.

THE LAW OF DIMINISHING MARGINAL UTILITY

Things that you like, use, or think you might use give you satisfaction. Your satisfaction rises with each unit you buy, but the amount of additional satisfaction, or marginal utility, diminishes with each additional unit. For example:

Suppose you normally buy five sandwiches for $3.25 each during a school week. If you had unlimited money, how many would you buy? 10, 20, or 30? **(1)** _____ If you bought three and ate them at one sitting, which would you enjoy the most: the first, the second, or the third? **(2)** _____ What effect would a drop of price have in your enjoyment of the third sandwich? **(3)** _____

REAL INCOME EFFECT

Your income limits the amount of money you can spend. If the price of an item rises while your income stays the same, you cannot keep buying it in the same quantity.

Suppose you have $25 a week to spend on lunches. You usually buy five sandwiches for $3.25 each and five beverages at $1.25 each. What is the total cost of your sandwiches for a week? **(4)** _____ For your beverages? **(5)** _____ What is left of your $25 at the end of a week? **(6)** _____

If the beverage price goes up to $1.50, how much do the five drinks cost? **(7)** _____ What is left of your $25 at the end of a week? **(8)** _____ Did your real income increase or decrease? **(9)** _____

SUBSTITUTION EFFECT

Sometimes two different items with the same price satisfy basically the same need. If the price of one drops or rises, you will probably substitute the lower priced item for the higher priced one.

(10) Suppose you enjoy having either a sandwich or a pizza for lunch. Complete the tables below to show how your lunches for a week might change if the price of one rises.

Food	Original Cost	Purchases per week	Amount spent	New price	Purchases now per week	Amount spent
Sandwich	$3.25	5		$3.75	0	
Pizza	$3.50	0		$3.50	5	

By what percent did the cost of a sandwich increase? (Percent increase = amount of increase divided by the original price) **(11)** _____. You decide to switch to having just pizza for lunch. By what percent did the original cost of your five sandwich lunches (including five beverages at $1.25 each) increase? (Percent increase = total increase divided by initial cost of lunches) **(12)** _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

MATH PRACTICE FOR ECONOMICS ACTIVITY 7

COMPETING IN THE MARKETPLACE

Directions: *Answer the following questions.*

MONOPOLY

You are a retired farmer, but you still want to participate at the weekly farmer's market. You buy 100 hats that say "Think Globally, Buy Locally" to sell there. Your total cost for the hats is $450. To break even, you must sell the hats for **(1)** _____ apiece. But since the hats are a new item at the market and you are the only seller, you can charge as much as you want as long as people are willing to buy at the price you set. You try a different price each year for four years to see what the market will bear. Each year you start with 100 hats. In addition to your costs of $450 for the hats, you pay $25 for the market booth. Compute your profit or loss for each year by filling in the chart below.

Price	Quantity Sold	Revenue	− Cost	= Profit (Loss)
(2) $8	100			
(3) $9	95			
(4) $10	90			
(5) $12	20			

What is the highest price you can charge and still make a profit? **(6)** _____

PERFECT COMPETITION

The fifth year you are setting up at the market when you discover that someone else is selling the same type of hat with "Market!" printed on it. They are charging $8 a hat. You don't want to lose sales, but you do want to make a good profit and so does your competitor. You figure there is no way that you can charge $10 and compete, so you drop your price to $9. If 150 hats are sold at the market each year, complete the chart to find the equilibrium price.

Year	Your Price	Hats Sold	Competitor's Price	Hats Sold
(7) Fifth	$9.00		$8.00	90
(8) Sixth	$8.75	65	$8.25	
(9) Seventh		75	$8.50	75

What is the equilibrium price reached in the seventh year? **(10)** _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

COMPARING PRICES AMONG COMPETITORS

The United States Postal Service (USPS) has no competitors in the delivery of first-class mail. The Postal Service does not, however, have a monopoly over other types of delivery. Customers can choose from many options.

The table below shows what it costs to send a 1-pound and a 20-pound package from Boston, Massachusetts, to Denver, Colorado, by three carriers. The prices reflect some differences among the carriers. Federal Express (FedEx), for instance, charges one rate for delivery anywhere in the continental United States. DHL and USPS have different rates for different zones.

▼ DOMESTIC SHIPPING RATES

	1-pound package			20-pound package		
	USPS	DHL	FedEx	USPS	DHL	FedEx
Next day	$18.80	$27.83	$32.54	$56.35	$75.21	$95.82
Second day	$4.05	n/a	$26.66	$30.30	n/a	$76.71
Third day	n/a	$10.72	$14.16	n/a	$48.33	$48.96
Ground	$1.73	$4.29	$4.67	$9.03	$12.55	$13.63

Source: rates quoted by carriers, Redroller, July, 2006

(1) What is the cheapest rate for sending a 1-pound package? _____ A 20-pound package? _____

(2) What is the most expensive rate for sending a 1-pound package? _____
A 20-pound package? _____

(3) How does speed of delivery affect the delivery price? _____
How does weight affect the delivery price? _____

(4) How much less expensive is it to send a 1-pound package by ground service with USPS than with FedEx?

_____

Than with DHL? _____

How much of a premium does each company charge for its fastest service? To find out, look at the percent of increase in price over each company's slowest service. Use this formula:

Percent increase = (rate for fastest − rate for slowest) ÷ rate for slowest × 100

For example, to find the percent increase charged by DHL, apply the formula as follows:

Percent increase = (27.83 − 4.29) ÷ 4.29 × 100 = 23.54 ÷ 4.29 × 100 = 549%

(5) What is the percent increase for a 1-pound package with FedEx? _____
With USPS? _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

HANDLING A CHECKING ACCOUNT

Congratulations! You finally have a checking account. You are careful to record every check and deposit accurately. Sometimes you even double-check your math with a calculator. Keeping your checkbook straight is not a problem. When the bank statement comes, though, you are confused.

Take a little time to sort it out. Begin by just reading the statement. It will list your starting balance, your current balance as of the statement date, the checks you wrote, the deposits you made, and any service charges. After you have put the canceled checks and deposit slips in order and checked them off in your checkbook, you can start the process of balancing your checkbook. The purpose of balancing your checkbook is to find out if your records for your money match the bank's records.

A method for balancing your checkbook is outlined below. Use these figures to try it out. Your checkbook register shows a balance of $310.59. You have one outstanding deposit of $231 and three outstanding checks for the following amounts: $14.57, $127.00, and $8.11. Looking at your bank statement, you see that the bank lists your current balance as $318.62. In addition, a number of service charges are detailed in the statement:

(1) Check fee: 27 checks at $.20 each

(2) Base charge of $4 for going below the minimum balance

(3) Overdraft fee of $15 for writing a check for $150 when your balance was down to $95

(4) Check order for new checks at $24.95

You also note that the statement shows that you used the ATM to withdraw $40. You remember that you were in such a hurry that day you did not record and deduct this amount in your checkbook.

Directions: *Now that you have compared your register and the bank statement, follow these steps to balance your checkbook:*

(1) Total all your service charges and the ATM withdrawal. _____

(2) Total all your outstanding checks. _____

(3) Write down the current balance as shown on the statement. _____

(4) Add all outstanding deposits to the current balance. + _____

= _____

(5) Subtract the total service charges and ATM withdrawal (step 1). − _____

= _____

(6) Subtract all outstanding checks (step 2). − _____

(7) Compare the result with the balance written in your checkbook: _____

Do the two match? _____

What do you do if the two balances do not match? Check your math, both in your check register and in your calculations above. Make sure that you have recorded each check and deposit correctly.

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

FIGURING FINANCE CHARGES

Different credit card companies use different interest rates to calculate finance charges. They also use different methods of calculation. Each method applies the monthly interest rate to an account's balance at a different point during the month. Consider these three methods.

Previous Balance
Finance charge = Amount owed at beginning of the month × monthly interest rate
Adjusted Balance
Finance charge = Amount owed at end of the month × monthly interest rate (To calculate the amount owed at the end of the month, subtract any payments made from the amount owed at the beginning of the month.)
Average Daily Balance
Finance charge = Average daily balance × monthly interest rate (To calculate the average daily balance, add the amounts owed each day and divide by the number of days in the month or billing period.)

Directions: *Use the above table to calculate and compare the amount of interest paid.*

Suppose that you spent $200 on clothes and paid with a credit card. Your credit card company's monthly interest rate is 1.6 percent, and you paid $100 of your bill halfway through the month. Figure out the finance charge for the first two methods.

(1) Previous Balance _____ **(2)** Adjusted Balance _____

Now figure the finance charge with the average daily balance method. Base your calculations on a 30-day month. Provide the amount of the average daily balance and the finance charge.

(3) Average Daily Balance _____ Finance Charge _____

Most credit card companies advertise their APR. APR stands for annual percentage rate. In general, the monthly interest rate is found by dividing the APR by 12. Give the monthly interest rates for each of the following APRs.

(4) 14.4% _____ 19.2% _____ 10.8% _____

Finally, see how much the clothes you charged will cost you in the end if you pay $50 a month. Use the 1.6 percent monthly rate again and the previous balance method to fill in the chart. **(5)**

	January	February	March	April	May
Previous Balance	200.00	153.20			
Finance charge	+ 3.20	+	+	+	+
TOTAL	= 203.20	=	=	=	= **
Payment	− 50.00	− 50.00	− 50.00	− 50.00	−
New Balance	= 153.20	=	=	=	

** Add this amount to the $200 you have paid to see what the clothes actually cost you.

Actual cost of clothes = **(6)** _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

MATH PRACTICE FOR ECONOMICS ACTIVITY 11

COMPUTING HOUSING COSTS

You have graduated from high school, and you need to find a place to live in the city where your college or new job is located. There are many factors to consider in choosing a place to live, including location, size, and price. You have a few ideas about what you are looking for and can afford. You know that you want to be right in the city, not in a nearby town, but you have not decided yet whether you will live alone or share a place with one or two of your friends. Your cat will be coming with you. You have $4,000 for housing for the year.

Directions: *Look over these ads for places to rent. Jot down how much your monthly rent will be for each place listed. Assume that you will share a two-bedroom place with one friend and a three-bedroom place with two friends.*

(1) Room. Economy Inn. Route 13. $95/week. _____
(2) Large 1-bedroom apt. Freeville. $400 includes. _____
(3) Downtown 3-bedroom apt. $690 includes. _____
(4) 2-bedroom apt close to campus. $600 includes. _____
(5) Deluxe 1-bedroom apt. No pets. $525+. _____
(6) Fine room downtown with fireplace, patio. $295 includes. _____
(7) 2-bedroom, separate entrance. $550 includes. _____
(8) Room. Share house, nonsmoking. $275 includes. _____
(9) New 3-bedroom apt, no pets. $525 includes. _____
(10) 1-bedroom apt near mall. $470 includes. _____
(11) 2-bedroom, yard, pets welcome. $400+. _____

You realize there are several places you can reject right away. Cross out the places that do not allow pets. Then cross out the places that are out of town or on the outskirts: #1, #2, #10.

What is the cheapest place left? **(12)** _____ You notice, though, that while most of the ads say "includes" following the rent, the one that seems cheapest does not. It has a plus sign instead. What does this mean? "Includes" means that the rent you pay includes the cost of utilities (electricity, heat, water) for the month. The plus sign means that you must pay for utilities in addition to the amount listed as rent. Look again. What is the cheapest place for you now? **(13)** _____

The place advertised in #11 still appeals to you, so you ask about other expenses. The landlord gives you these rough monthly figures: water $20, heat and electricity combined $100. The landlord also says that you will have to pay $10 a month for garbage pickup and that if you want cable TV, the local price is $24 for hook-up and $20 a month after that for basic service. You will also need a phone, which you find out is $30 to buy, $60 to install, and $20 a month, not counting long-distance calls.

If you split all the monthly costs with a roommate, what is your monthly share? **(14)** _____
If you split all the one-time costs with a roommate, what is your share? **(15)** _____
How much will it cost you per month to live in #11? **(16)** _____
Can you afford the monthly costs (rent + utilities) for a year with $4,000? **(17)** _____
How much will you have left over to cover your share of the one-time costs and other expenses? **(18)** _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

MAKING MONEY WITH YOUR MONEY

Where do you save money? Do you put it under a mattress for safekeeping? Or do you invest it, so that it will grow over time? Putting it in a savings account or other financial instrument allows you to earn interest, that is, to make money with your money.

There are two types of interest: simple and compound. Simple interest of 4 percent means that you will earn 4 percent for each year that your money is invested. Annually compounded interest of 4 percent means that you will earn 4 percent the first year. The next year you will earn 4 percent on both your initial investment and on the first year's interest. The following year you will earn 4 percent on your initial investment, and 4 percent on each of the previous two years' interest, and so on.

You can compute either type of interest using a formula. You will want to use a calculator to compute compound interest. Use the key marked ^ or x^y to compute exponents.

Simple interest
Final balance = initial deposit + (initial deposit × annual interest rate × number of years)

Compound interest
Final balance = initial deposit × (1 + interest rate per period)$^{\text{number of periods}}$

To find the amount that a $500 investment will grow to after two years at 4 percent simple interest, calculate:

$$500 + (500 \times 0.04 \times 2) = 500 + 40 = \$540$$

Now suppose you invested the $500 at the same rate of interest, but the interest is compounded quarterly (four times per year). For each of eight quarters, you will earn 1 percent interest, which will be added to the principal before computing the next quarter's interest. So now find:

$$500 \times (1 + 0.01)^8 = 500 \times (1.01)^8 = 500 \times 1.0829 = \$541.45$$

Find the final balance for each investment under simple and compound interest.

Initial Amount	Interest Rate	Time	Simple Interest	Interest Compounded Annually	Interest Compounded Quarterly
$500	6%	5 years	(1)		
$1,500	4%	2 years	(2)		
$12,000	8%	10 years	(3)		

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

MATH PRACTICE FOR ECONOMICS ACTIVITY 13

ANALYZING A PAYCHECK

Each pay period employers withhold a portion of the federal income tax and often part of the state income tax so that employees do not have to make one large payment at the end of the year. The paycheck stub provides information about amounts deducted from a person's pay such as social security (FICA taxes) and retirement funds.

A paycheck stub might look like this:

	Gross Pay	FICA	Federal	State	Retirement	Net Pay
CPP (current pay period)	473.30	29.34	54.00	11.93	14.19	363.84
YTD (year to date)	1,419.90	88.02	162.00	35.79	42.57	

Directions: *Study the stub carefully, then do some math to answer these questions.*

How many paychecks has this person received to date? **(1)** _____

What amount is actually printed on the paycheck? **(2)** _____

How much has this person had withheld for federal income tax in this pay period?

(3) _____ For state tax? **(4)** _____

What percentage of the person's gross pay is withheld for federal taxes each payment period?

(5) _____ For state tax? **(6)** _____

What percentage of gross pay is contributed to FICA? **(7)** _____ To the retirement fund? **(8)** _____

Fill in this paycheck stub for someone who has worked two weeks for a total of 80 hours at $8.14 an hour. The person's pay is based on 50 weeks per year. The year's total federal income tax withheld for this person will be $2,341, and the total state tax withheld will be $628.

	Gross Pay	FICA	Federal	State	Retirement	Net Pay
CPP (current pay period) **(9)**		40.37			0	

Federal taxes withheld comes to a sizable amount. Where does this money go? One way of looking at how the federal government spends your tax dollars is to apply the percentages spent by the government in different areas to the amount you pay in federal taxes. For instance, in a recent year the government spent 2.4 percent of its budget on veterans' programs. It is possible to think that 2.4 percent of your total taxes went to veterans' programs. If you paid $1,120 in taxes, then, $26.88 went to veterans' programs. To arrive at the dollar amount, you multiply your total taxes by the percentage: $1,120 × .024 = $26.88.

Calculate how many of your tax dollars went to each of the following areas:

(10) 7.1% health _____ **(11)** 19.6% national defense _____

(12) 3.5% education _____ **(13)** 13.7% interest payment on the national debt _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

PAYING TAXES

Many factors affect how much income tax you pay. Two important factors are how much you earn and where you live. The amount you pay in federal taxes does not depend on where you live, but the amount you pay in state taxes varies from state to state.

Take a look at federal income tax first. Currently there are six tax brackets for individuals: 10 percent, 15 percent, 25 percent, 28 percent, 33 percent, and 35 percent.

Here is how to calculate federal tax for a single individual:

If taxable income is more than	But not more than	You pay	of the amount over
$0	$7,300	10%	$0
7,300	29,700	730 + 15%	7,300
$29,700	71,950	4,090 + 25%	29,700
71,950	150,150	14,652 + 28%	71,950
150,150	326,450	36,548 + 33%	150,150
326,450		94,727 + 35%	326,450

Directions: *Use the table to compute the tax that would be paid on each of the following incomes:*

(1) $12,000 _____
(2) $28,000 _____
(3) $53,600 _____
(4) $120,000 _____
(5) $360,000 _____

What you pay in state income tax depends on what state you live in. Some states have a range of tax rates. Some, such as Illinois, Michigan, and Pennsylvania, have a flat rate, which applies to all incomes. Other states, like Connecticut, have a graduated tax. Still other states, such as South Dakota, have no state income tax at all.

Suppose your taxable income was $12,000.

(6) If you lived in Illinois, you paid 3 percent, or $_____.
(7) If you lived in South Dakota, you paid 0 percent, or $ _____.
(8) If you lived in Michigan, you paid 3.9 percent, or $ _____.
(9) If you lived in Connecticut, you paid $300 plus 5 percent of earnings above $10,000, or _____.
(10) If you lived in Pennsylvania, you paid 3.07 percent, or $ _____.

If your taxable income was $43,000, how much would you pay in state income tax in
(11) Illinois? _____ **(12)** Michigan? _____

Sales tax rates also vary from state to state. For example, the state sales tax in Hawaii is 4 percent, in Mississippi 7 percent, and in Florida 6 percent.

How much sales tax would you have to pay on a $12 CD bought in
(13) Hawaii? _____ **(14)** Mississippi? _____ **(15)** Florida? _____
How much sales tax would you pay on a $975 couch bought in
(16) Hawaii? _____ **(17)** Mississippi? _____ **(18)** Florida? _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

EVALUATING INCREASES IN FEDERAL SPENDING

Spending by the federal government increased from $590 billion in 1980 to nearly $1.7 trillion in 1998 (adjusted for inflation to 1992 dollars in the table below). During the same period other economic indicators, such as the Consumer Price Index and the Gross Domestic Product, also rose. To find whether federal spending increased faster than other parts of the economy, complete the table below.

To calculate the percent of increase over five years in the columns below, subtract the figure for five years earlier from the figure for the given year. Then divide that amount by the earlier figure. Round your answers to the nearest whole percent. For example, the solution to problem (1) would look like this:

(1,210 − 1,020) ÷ 1,020 = 0.186, or 19%

Year	A. Federal Spending (in billions of 1992 dollars)	Percent Increase	B. GDP (in billions of 1992 dollars)	Percent Increase	C. Federal Spending Per Capita (in 1992 dollars)	Percent Increase or Decrease
1980	1,020		4,615		4,476	
1985	1,210	**(1) 19%**	5,324	**(5)**	5,017	**(9)**
1990	1,350	**(2)**	5,744	**(6)**	5,438	**(10)**
1995	1,410	**(3)**	7,265	**(7)**	5,354	**(11)–**
1998	1,440	**(4)**	8,511	**(8)**	5,337	**(12)–**

Source: *Statistical Abstracts of the United States: 1998 and 1999*

During which five-year period did federal spending (using inflation-adjusted dollars) increase the most? **(13)** _____ During which five-year period did federal spending per capita decrease the most? **(14)** _____ How is using the percent of increase helpful in answering questions 13 and 14? **(15)** _____

Now look at data sets A, B, and C. Which set or sets would you use to support an argument that federal spending grew excessively in those 20 years? **(16)** _____ Which set or sets would you use to support an argument that federal spending did not grow in comparison to the rest of the economy during those 20 years? **(17)** _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

CHOOSING A FINANCIAL INSTITUTION

How do you decide where to do your banking? You might choose a bank close to where you live or work. You might decide to use a bank that has higher interest rates or lower fees for your banking needs, or both.

Compare the three types of depository institutions listed below. The information about the institutions' fees and interest rates for three kinds of accounts (regular savings, interest checking, and certificate of deposit, or CD) should help you decide where to put your money.

	Regular Savings			Interest Checking			24-Month CD	
	Minimum balance w/out fee	Fee	APY*	Minimum balance w/out fee	Fee	APY	Minimum deposit	APY
Commercial bank	$300	$2.50/mo.	1.10	$1,000	$12/mo.	1.50	$1,000	4.76
Savings bank	$250	$3/mo.	2.02	$500	$7/mo.	2.75	$500	4.70
Credit union	$50	None	3.09		Not available		$500	5.30

* Annual Percentage Yield, or the annual interest rate after compounding

Imagine that you have $100 that you want to save. Could you deposit this amount in a 24-month CD at one of the institutions? **(1)** _____ What alternative do you have for saving the $100? **(2)** _____

Now compare a regular savings account at the three institutions for a deposit of $100 for one year by filling in the table below. When working with APY, use the simple interest formula $I = p$ (principal) $\times r$ (rate) $\times t$ (time).

Interest	–	Annual fees	=	Total
Commercial bank **(3)**				
Savings bank **(4)**				
Credit union **(5)**				

Which is your best choice for a deposit of $100? **(6)** _____

Suppose you want to open a checking account. Your average daily balance (the amount that the interest is computed from) is about $350 each month. How much would a checking account cost at each institution?

Interest	–	Annual fees	=	Total
Commercial bank **(7)**				
Savings bank **(8)**				

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

MATH PRACTICE FOR ECONOMICS ACTIVITY 17

ANALYZING INVESTMENT TRENDS

Trends in economic development can be determined by studying statistical information over a period of time. Unforeseen factors and events do come into play and may affect trends that past data suggest. Nevertheless, trends remain important as a planning tool for business people and government officials.

Try tracking trends in direct investment: foreign investment in the United States and the United States' investment abroad. The table below provides data about the share of foreign ownership of American industries.

Directions: *Indicate the percent of increase in foreign investment in the United States between 1991 and 2001. (Divide the difference by the 1991 figure). Answer the questions below the table and then make a prediction for 2011.*

Country	1991 (millions)	2001 (millions)	percent change	Prediction for 2011
Canada	$37,301	$92,420	**(1)**	
Finland	$1,305	$7,620	**(2)**	
Germany	$28,618	$162,314	**(3)**	
Ireland	$1,823	$25,632	**(4)**	
Japan	$92,896	$149,859	**(5)**	
Kuwait	$1,891	$964	**(6)**	
Taiwan	$1,142	$2,520	**(7)**	
U.K.	$100,386	$197,651	**(8)**	

Source: *World Almanac 1994;* U.S. Department of Commerce, Bureau of Economic Analysis

(9) Which country showed the greatest change in total dollars? _____

(10) Which country showed the greatest percent change? _____

Now do the same using the following data about United States' direct investment abroad.

Country	1991 (millions)	2001 (millions)	percent change	Prediction for 2011
Australia	$15,795	$27,778	**(11)**	
Brazil	$14,882	$32,027	**(12)**	
Canada	$68,853	$152,601	**(13)**	
Japan	$24,938	$55,651	**(14)**	
U.K.	$78,072	$228,320	**(15)**	

Source: *World Almanac 1994;* U.S. Department of Commerce, Bureau of Economic Analysis

(16) In which country does the United States invest the most? _____

(17) The least? _____

(18) In which country did the United States increase its dollar investment the most? _____

(19) In which country did the percentage of investments increase the least? _____

(20) Which country experienced the least change in total dollars? _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

PLANNING FOR THE FUTURE

When planning for your economic future, you must consider the risks and rewards of a variety of investments. If you diversify your investments, you will reduce your risk.

At age 24, you decide to begin saving and investing for the future. You enroll in your company's Individual Retirement Account (IRA) program. You contribute $50/month to your IRA account, which your employer matches 100 percent. You also begin saving for a down payment on a house and start investing $100 each month in a mutual fund. By age 30, your investments are: company IRA, $14,000; mutual funds, $20,000; and savings account, $9,500.

Your goal is to have $300,000 in net worth (assets minus liabilities) by age 40. To try to reach this goal, you distribute your investments as shown in the table below. You increase your IRA contributions to $100 per month because your employer will match that amount 100 percent. You buy a house for $180,000, making a 5 percent down payment using the money from your savings account. Because your monthly mortgage is $1,100, you stop investing in mutual funds and savings, but you allow those investments to remain and grow.

Directions: *To determine your net worth at age 40, use the following instructions to fill in the columns of the table below.*

(1) The value of your IRA investment at age 30 plus your additional monthly contributions (including employer match) doubles in value. Find the value of your IRA.
(2) The value of your mutual fund increases by 150 percent. Find the value of your mutual fund.
(3) The market value of your house increases 110 percent. Find the value of your house.
(4) Your savings account grows by 30 percent. Find the value of your savings account.
(5) Add up your assets to determine the total value.
(6) Your mortgage loan is reduced to $121,000. You also have a car loan of $15,000. Find your total liabilities.
(7) Subtract your total liabilities from your total assets to determine your total net worth.

Investment	Value of Age 30	Value of Age 40
IRA	$14,000	**(1)**
Mutual funds	$20,000	**(2)**
House	$180,000	**(3)**
Savings account	$500	**(4)**
Total assets	$214,5000	**(5)**
Total liabilities	$171,000	**(6)**
Total net worth	$43,500	**(7)**

(8) Did you reach your goal of $300,000 net worth by the age of 40? _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

MATH PRACTICE FOR ECONOMICS ACTIVITY 19

FIGURING INFLATION'S EFFECTS

Higher inflation often means lower living standards. Even if you receive a pay raise, your purchasing power may decrease unless it matches the rate of inflation. You can find how a raise will affect your purchasing power using this equation:

Rate of Raise − Inflation Rate = Change in Purchasing Power

Complete the table below and answer the questions that follow.

Rate of Raise	Rate of Inflation	Change in Purchasing Power
5%	1%	4%
5%	8%	**(1)**
8%	**(2)**	2%
(3)	7%	−4%

If the inflation rate is 7 percent and your raise is 3 percent, has your purchasing power increased or decreased? **(4)** _____ By what percent? **(5)** _____

Now try this example. Suppose you earn $400 a week and inflation averages just 3 percent this year. By what percent do your wages need to increase to stay even with inflation? **(6)** _____ To find out what this percent is in dollars, write the percent as a decimal **(7)** _____ and multiply by your weekly salary of $400. Your raise would need to be **(8)** $ _____ for a total weekly salary of **(9)** $ _____ just to maintain your purchasing power. To increase your purchasing power by only 1 percent, what would you need to earn each week? **(10)** _____

Inflation has a serious effect on the lives of people living on fixed incomes, primarily retirees. Suppose you retired in 2000 and started receiving monthly checks of $1,000. You spent $600 on rent and utilities, $100 on food, and $150 on medical care, including insurance. That left you **(11)** $ _____ for other expenses.

By 2005 everything was more expensive. The CPI for housing changed from 170 to 196, for food from 168 to 191, and for medical expenses from 261 to 323. To find what your new expenses are, use this formula:

New expense = Old expense × 2005 CPI ÷ 2000 CPI

Your new expense for housing is about **(12)** _____, for food is about **(13)** _____, and for medical care is **(14)** _____. Would your monthly check cover these expenses? **(15)** _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

CREATING MONEY

Each time you buy a government security, such as a Treasury bill, you are loaning the federal government money to pay its suppliers. Then these suppliers have money to pay their suppliers, and so on. Since many people are using the same dollars over and over again, money is created.

Suppose you buy a $5,000 Treasury bill. How much money would that bill create? Complete the following table to find out. (Round your figures to the nearest dollar.) Note: The Federal Reserve requires that 10 percent of the deposit be kept by each bank as a reserve.

Investment Amount	Reserve Amount (10%)	Amount Loaned Out	Total Money Invested
$5,000	0.1 × 5,000 = 500	5,000 − 500 = 4,500	5,000
$4,500	0.1 × 4,500 = 450	4,500 − 450 = 4,050	5,000 + 4,500 = 9,500
$4,050	**(1)**	**(2)**	**(3)** 9,500 + _____ = _____
(4)			
(5)			
(6)			
(7)			
(8)			

As you can see, the total amount of money generated by your initial $5,000 investment has grown considerably. Continuing the table would result in an even larger figure. To find out how much money your investment will grow to altogether, use this formula:

Total of All Investments = Initial Investment ÷ 0.1

The investment above would create money equal to $5,000 ÷ 0.1 or $50,000.

Use the formula to find the amount of money created by each of these investment amounts.

(9) $200 _____ **(10)** $25,000 _____

These examples assume that all money, except the reserve requirement, is put back into the economy as either spending or investments.

The other option available to consumers is to hoard money. Then the hoarded money, as well as the reserve requirement, is not available for other consumers to borrow. The reinvested percent goes down. For example, if everyone tucked 2 percent of their earnings under a mattress, then neither the 10 percent reserve requirement nor the 2 percent that is hoarded would be reinvested. The initial investment in the first example would grow to $5,000 ÷ 0.12 or **(11)** _____.

In 1999, the Federal Reserve anticipated many people would hoard money because of anxiety over the Y2K problem (a computer bug associated with the year 2000). To counteract this, it put extra money into circulation for the year. Hoarding also comes into play in the economies of some developing nations where people have little trust in their banking system.

Copyright © by The McGraw-Hill Companies, Inc.

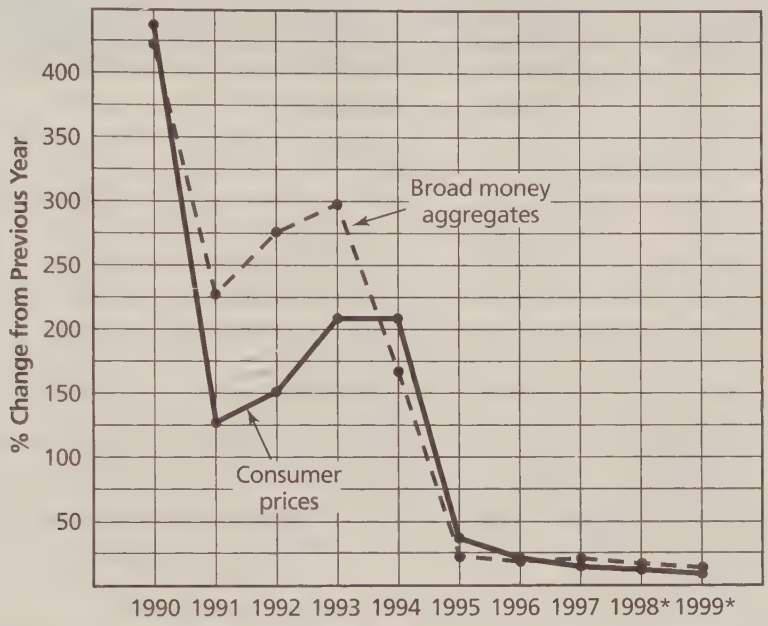
Name _____ Date _____ Class _____

MATH PRACTICE FOR ECONOMICS ACTIVITY 21

ACHIEVING ECONOMIC STABILITY

In the United States, the Federal Reserve Board controls the supply of money. In many other countries, the government makes these decisions, with greater or lesser effectiveness. The graph below shows the changing money supply and prices in 32 developing nations of the Western hemisphere.

Money Supply and Consumer Prices for 32 Western Hemisphere Developing Nations



*IMF estimates

Source: *World Economic Outlook,* International Monetary Fund, 1998

1. The graph shows the percent change each year in the money supply and consumer prices. What was the rate of increase in consumer prices in 1991? _____

2. Suppose you lived in such an economy and received no raise during the year. Compare the purchasing power of your wages at the end of the year with their purchasing power at the beginning of the year. _____

3. In what ways might this affect your purchasing decisions? _____

4. What percent pay raise is needed to keep up with inflation? _____

5. What would happen to people living on fixed incomes? _____

6. In what year did these nations first make an effort to control the supply of money? _____

7. How did consumer prices react from 1991 to 1995? _____

8. During which two-year period did they finally come close to subduing inflation? _____

9. What money supply policy was in effect during those years? _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

WORKING WITH FOREIGN EXCHANGE RATES

To facilitate world trade, foreign exchange markets buy and sell foreign currency. This allows individuals and businesses to easily convert from one currency unit to another.

Below is a table of foreign exchange rates for a recent day. These rates change daily and are posted in large banks and major newspapers. The exchange rate is often given to four or five decimal places.

Country (currency unit)	Foreign Currency in U.S. Dollars	U.S. Dollar in Foreign Currency	Country (currency unit)	Foreign Currency in U.S. Dollars	U.S. Dollar in Foreign Currency
Argentina (peso)	.32	3.08	Egypt (pound)	.18	5.70
Australia (dollar)	.75	1.33	Germany (euro)	1.26	.79
Britain (pound)	1.85	.54	India (rupee)	.02	46.65
Belgium (franc)	.03	31.38	Japan (yen)	.008	116.49
Canada (dollar)	.88	1.13	Philippines (peso)	.02	51.99
Czech Rep. (koruna)	.05	22.38	Portugal (escudo)	.006	158.30
Chile (peso)	.002	533.6	Saudi Arabia (riyal)	.27	3.75
China (renminbi)	.13	7.97	South Africa (rand)	.14	7.33

Does the table make sense to you? Look at the Euro. It is worth $1.26 in U.S. currency, and one U.S. dollar will buy 0.79 Euros. The Euro, the single currency for all of Europe, replaced many currencies, such as the Belgian franc and the German mark, in 2002.

How much is each of the following worth in U.S. dollars?

(1) 1 Canadian dollar _____ 1 Indian rupee _____ 1 Philippine peso _____

How much is one U.S. dollar worth in each of these countries?

(2) Saudi Arabia _____ Germany _____ China _____

Suppose you travel to Portugal and exchange $100 for escudos. How many will you get? **(3)** _____

When you leave, you exchange 100 escudos for dollars. How many will you get? **(4)** _____

Suppose you purchased each item below. Find the price in U.S. dollars.

(5) A sari in India for 700 rupees _____ **(6)** A painting in London for 1,250 pounds _____

(7) A belt in Chile for 1,250 pesos _____ **(8)** A shirt in Canada for 40 dollars _____

In which countries would a souvenir marked 1,000 in the local currency cost under $10?

(9) _____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

CONVERGING ECONOMIC SYSTEMS: A RUSSIAN CASE STUDY

Since the fall of the Iron Curtain in 1990, Russia has had a rocky road to capitalism. The speed of the change-over precluded developing effective tax collection and expenditure management systems, as the table below shows. This has been, and continues to be, a serious problem.

Government Revenue and Expenditures as a Percent of Russian GDP

	1996	1997	1998
Revenues	13.0%	11.9%	10.7%*
Expenditures	22.1%	18.9%	15.4%*

Source: *World Economic Outlook,* International Monetary Fund, 1998
* Estimates by the Ministry of the Economy of the Russian Federation

By what percent did expenditures outpace revenues in 1996? **(1)**_____ In 1997? **(2)** _____ In 1998? **(3)**_____ What trend do you see in these numbers? **(4)** _____

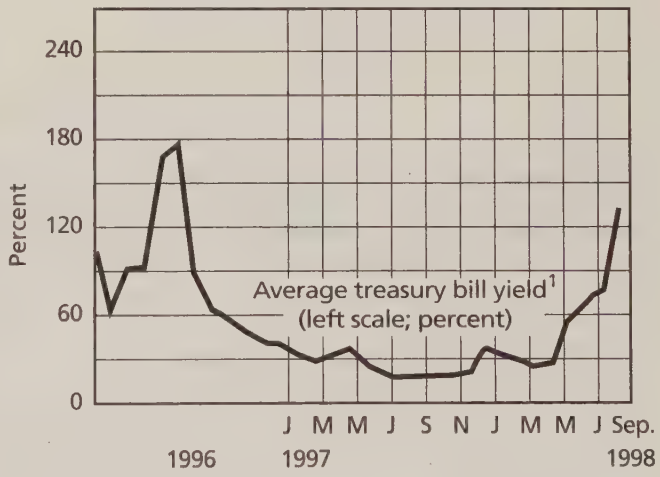
A government that outspends its revenue cannot pay its obligations: Government workers and pensioners may not get paid, interest on loans may not be paid, and it may not pay off bonds when they are due. People who are receiving promises to be paid, instead of wages, turn to the informal economy, relying heavily on bartering. The IMF estimates that bartering during this time represented 50 percent of the Russian economy. How would this affect tax revenues? **(5)** _____

The other problems of collecting interest on and cashing in bonds have eroded investor confidence. Lenders are difficult to find and will only participate if they are given high rates of interest, as the graph at the right shows.

What is the highest rate of interest reached during the three years shown? **(6)** _____ What is the lowest rate of interest? **(7)** _____ What are some measures you would propose to try to bring down the interest rates? **(8)** _____

Russia's move toward capitalism has been extremely difficult on its people, its political systems, and its monetary systems. The solution appears to remain far in the future.

Yield on Russian Treasury Bills



[1]The Russian treasury bill market was suspended as of August 17, 1998.

Source: *World Economic Outlook,* International Monetary Fund, 1988

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

COMPUTING PER CAPITA GROSS DOMESTIC PRODUCT (GDP)

Per capita Gross Domestic Product is often used as a rough measure of a nation's prosperity. Source estimates vary, but the United States and other developed countries have per capita GDP that ranges between $12,000 and $27,000 annually. Per capita GDP in developing nations is considerably less, and in the world's poorest nations it is extremely low.

Try computing the per capita GDP for selected countries. The table below provides the data you need. You also need to know a few things before getting started. The abbreviations *mln, bln,* and *trl* in the GDP column stand for million, billion, and trillion. To simplify the math, round the population to the nearest million and the GDP to millions of dollars, as in the examples done for you. Then to get per capita GDP, you can divide, using this equation:

Per Capita GDP = GDP ÷ Population

Directions: *Fill in the table.*

Country	Population	Rounded (millions)	GDP	Rounded (millions)	Per Capita
Afghanistan	16,100,00	16	$3.1 bln	3,100	$194
Cambodia	7,300,00	7	$930 mln	930	**(21)** _____
China	1,169,600,000	**(1)** _____	$393 bln	**(11)** _____	**(22)** _____
Ecuador	10,930,000	**(2)** _____	$11.5 bln	**(12)** _____	**(23)** _____
France	57,300,000	**(3)** _____	$1 trl	**(13)** _____	**(24)** _____
Gabon	1,100,000	**(4)** _____	$5.3 bln	**(14)** _____	**(25)** _____
India	886,400,000	**(5)** _____	$328 bln	**(15)** _____	**(26)** _____
Japan	124,500,000	**(6)** _____	$2.3 trl	**(16)** _____	**(27)** _____
Madagascar	12,600,000	**(7)** _____	$2.4 bln	**(17)** _____	**(28)** _____
Portugal	10,448,000	**(8)** _____	$87 bln	**(18)** _____	**(29)** _____
Saudi Arabia	16,900,000	**(9)** _____	$104 bln	**(19)** _____	**(30)** _____
United States	256,000,000	**(10)** _____	$5.6 trl	**(20)** _____	**(31)** _____

Which three countries have the highest GDP? **(32)** _____

The highest per capita GDP? **(33)** _____

Which three countries have the lowest GDP? **(34)** _____

The lowest per capita GDP? **(35)** _____

Compare the data on life expectancy with the per capita GDP:

Afghanistan	44	Cambodia	49	China	70	Ecuador	69
France	78	Gabon	53	India	57	Japan	79
Madagascar	53	Portugal	74	Saudi Arabia	66	United States	75

[Source: *World Almanac 1994,* pp. 736ff.; mean of male and female]

Which three countries have the lowest life expectancy? **(36)** _____

Which three countries have the highest life expectancy? **(37)** _____

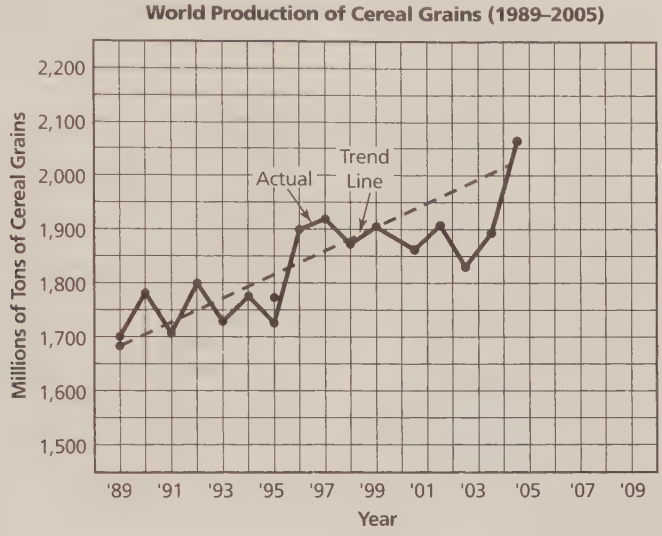
Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

PREDICTING WORLD FOOD SUPPLIES

The most important sources of food for the world's growing population are cereal grains, such as wheat, rice flour, and oats. Each person consumes about 680 pounds (0.31 metric tons) of these cereal grains each year.

By observing trend lines in population growth and cereal production, you can predict how long the world will be able to feed its people. A trend line is a smooth line that shows the direction in which the data is changing.



1. The heavy line on the graph above shows the amount of cereal grains produced for the years shown. The dashed line shows the trend line. Extend the trend line to 2010 to predict the cereal grain production for that year if current trends continue.

2. How many metric tons of cereal grains are needed to feed the world's population each year? Complete the table below to find the minimum needed for each year. Use this formula:

Minimum metric tons needed = Population that year × 0.31

Year	Population (in millions)	Minimum metric tons needed	Year	Population (in millions)	Minimum metric tons needed
1989	5,234	a.	2000	6,153	c.
1995	5,684	b.	2005	6,529	d.

3. Plot these points on the graph above. Join them in a smooth curve. Then extend the graph to 2010 to predict the minimum cereal grain production needed for the population in 2010.

4. If current trends continue, until when will the world's food production keep up with the demands of its population? How can you tell? _____

_____

5. What two changes could avoid the potential problem forecasted in Step 4? _____

_____

Copyright © by The McGraw-Hill Companies, Inc.

Name _____ Date _____ Class _____

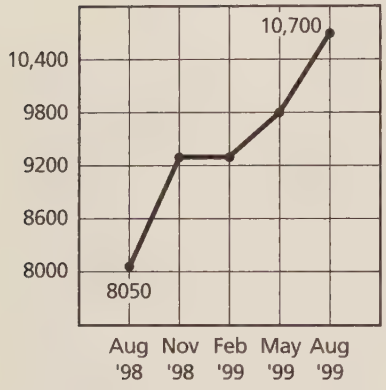
MATH PRACTICE FOR ECONOMICS ACTIVITY 26

INVESTING IN GLOBAL MARKETS

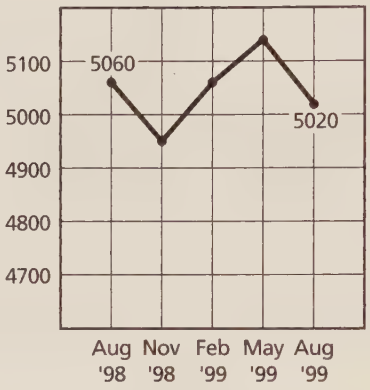
One way of investing money is by buying stocks. Each share of stock represents a small piece of ownership in that company. Unlike saving accounts and certificates of deposit, however, stock investments are not guaranteed. Their prices are governed by the laws of supply and demand, which means they can go down. Over 10-year periods, though, stocks have consistently had better yields than other forms of investment.

A stock index tracks the price performance of a selected number of stocks to indicate how well the market in general is doing. The graphs below show how three international indexes performed during the year August 1998 to August 1999.

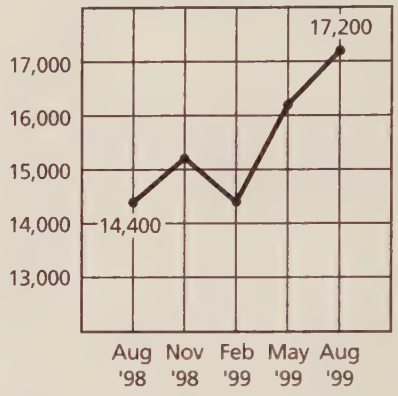
United States: Dow Jones Average



Germany: Xerta DAX Average



Japan: Nikkei 225 Average



Because the indexes use different bases, their performances may be difficult to compare. One way to do this is to find the percent of change for the year for each one. Use this formula:

Percent change = [(last August number ÷ first August number) −1] × 100

For example, the change in the Japanese market was:
[(17,200 ÷ 14,400) −1] × 100 = [1.194 − 1] × 100 = 19.4 percent
Since the change is a positive number, it represents an increase.

By what percent did the United States market change? **(1)** _____ By what percent did the German market change? **(2)** _____ Which market showed a decrease? **(3)** _____
Which of the three markets performed best during the year shown? **(4)** _____

During which periods of the year did the Japanese market decline? **(5)** _____
The German market? **(6)** _____
The U.S. market? **(7)** _____
During which period did all three markets decline? **(8)** _____
All three increase? **(9)** _____

Foreign markets tend to increase and decrease in different patterns from the U.S. market. So, by investing some money in the U.S. market and some in foreign markets, you can avoid some of the dramatic ups and downs that each individual market experiences.

Copyright © by The McGraw-Hill Companies, Inc.

ANSWER KEY

Activity 1

1. **b.** $250; $40
   d. $600; $360
2. Car A: $900; Car B: $1,400; Car C: $800
3. **a.** $12,100
   b. $3,600
4. Car A: $16,520; Car B: $6,320; Car C: $1,160
5. Total costs Car A: $9,520; Car B: $5,320; Car C: $4,160. Answers will vary, but may include safety of the passengers or total costs of each car.

Activity 2

1. $150
2. $.50 × 100 = $50
3. $1 × 50 = $50
4. $ .55 × 300 = $165
5. $415
6. $415 × 14 = $5,810
7. No
8. $90 × 14 = $1,260
9. $25 × 14 = $350
10. $50 × 14 = $700
11. $65 × 14 = 910
12. $560
13. $3,780
14. $5,810 − $3,780 = $2,030
15. $677 ($2,030 ÷ 3 = $677)

Activity 3

1. $532; $731; $1,064
2. $532; $365.50; $354.67
3. $660; $1,320; $1,980
4. $258 all
5. $402; $1,062; $1,722
6. $88; $176; $264
7. $314; $886; $1,458
8. 1, 2, 3
9. $314; $443; $486

Activity 4

1. $120
2. $180
3. $60 more
4. Stayed the same
5. $175
6. It is $5 less.
7. It decreased.
8. $206
9. It increased demand.
10. Yes
11. $2, $3, $5, $1
12. 60, 60, 35, 206
13. $120, $180, $175, $206
14. $1
15. Yes
16. No
17. No
18. Yes

Copyright © by The McGraw-Hill Companies, Inc.

ANSWER KEY

Activity 5

1. 5
2. 3
3. 1
4. 20
5. $40
6. $200
7. Answers will vary.
8. Answers will vary.
9. 5
10. $5
11. $20
12. 7
13. $63
14. $9.25
15. 9
16. $83.25

Activity 6

1. Answers will vary.
2. the first
3. none
4. $16.25
5. $6.25
6. $2.50
7. $7.50
8. $1.25
9. decrease
10. $16.25; 0; 0; $17.50
11. 15
12. 5.6

Activity 7

1. $4.50
2. $800, $475, $325
3. $855, $475, $380
4. $900, $475, $425
5. $240, $475, ($−235)
6. $10
7. 60
8. 85
9. $8.50
10. $8.50

Activity 8

1. $1.73; $9.03
2. $32.54; $95.82
3. Speedier delivery costs more; heavier packages cost more.
4. $2.94; $2.54
5. 5.97%; 987%

Activity 9

1. $89.35
2. $149.68
3. $318.62
4. $231.00; $549.62
5. $89.35; $460.27
6. $149.68; $310.59
7. $310.59; Yes

Copyright © by The McGraw-Hill Companies, Inc.

Activity 10

1. $200 × .016 = $3.20
2. $200 − $100 = $100 × .016 = $1.60
3. $200 × 15 days (=$3,000) + $100 × 15 days (=$1,500) = $4,500 ÷ 30 days = $150 (average daily balance); $150 × .016 = $2.40 (finance charge)
4. 1.2%; 1.6%; 0.9%
5.

	Feb.	March	April	May
Prev. balance	153.20	105.65	57.34	8.26
Finance Chrg.	+2.45	+1.69	+.92	+.13
TOTAL	=155.65	=107.34	=58.26	=8.39**
Payment	−50.00	−50.00	−50.00	
New Balance	=105.65	=57.34	=8.26	

6. $208.39

Activity 11

1. $380
2. $400
3. $230
4. $300
5. $525
6. $295
7. $275
8. $275
9. $175
10. $470
11. $200
12. #11
13. #3
14. $85
15. $57
16. $285
17. Yes
18. $580

Activity 12

1. $650; $669.11; $673.43
2. $1,620; $1,622.40; $1,624.29
3. $21,600; $25,907.10; $26,496.48

Activity 13

1. Three
2. $363.84
3. $54
4. $11.93
5. 11%
6. 2.5%
7. 6.2%
8. 3%
9. $651.20; $93.64; $25.12; $492.07
10. $79.52
11. $219.52
12. $39.20
13. $153.44

Activity 14

1. $1,435 ($12,000 − $7,300 = $4,700; $4,700 × .15 = $705; $705 + $730 = $1,435)
2. $3,835 ($28,000 − $7,300 = $20,700; $20,700 × .15 = $3,105; $3,105 + $730 = $3,835)
3. $10,065 ($53,600 − 29,700 = $23,900; $23,900 × .25 = $5,975; $5,975 + $4,090 = $10,054)
4. $28,106 ($120,000 − $71,950 = $48,050; $48,050 × .28 = $13,454; $13,454 + $14,652 = $28,106)
5. $106,469.50 ($360,000 − $326,450 = $33,550; $33,550 × .35 = $11,742.50 + $94,727 = $106,469.50)
6. $360
7. $0
8. $468
9. $400
10. $368.40
11. $1,290
12. $1,671
13. 48¢
14. 84¢
15. 72¢
16. $39
17. $68.25
18. $58.50

Copyright © by The McGraw-Hill Companies, Inc.

ANSWER KEY

Activity 15

1. 19%
2. 12%
3. 4%
4. 2%
5. 15%
6. 8%
7. 26%
8. 17%
9. 12%
10. 8%
11. −2%
12. −.3%
13. 1980–1985
14. 1995–1998
15. It is easier to mentally compute the changes between consecutive years using the percents than the actual data.
16. A and C
17. B

Activity 16

1. No
2. regular savings account
3. $1.10 − $30 = −$28.90
4. $2.02 − $36 = −$33.98
5. $3.09 − $0 = $3.09
6. the credit union
7. $5.25 − $144 = −$138.75
8. $9.63 − $84 = −$74.37
9. The saving bank is a better choice, but it is also expensive. Perhaps a non-interest-bearing account would be more affordable.
10. the credit union; $106.00

Activity 17

1. 147%
2. 484%
3. 467%
4. 1,306%
5. 61%
6. −49%
7. 121%
8. 97%

[predictions, reading down] Answers will vary.

9. Germany
10. Ireland
11. 76%
12. 115%
13. 122%
14. 123%
15. 192%

[predictions, reading down] Answers will vary.

16. U.K.
17. Australia
18. U.K.
19. U.K.
20. Australia

Copyright © by The McGraw-Hill Companies, Inc.

ANSWER KEY

Activity 18

1. $200 (monthly investment) × 120 (months invested) = $24,000 + $14,000 = $36,000 x 2 = $76,000
2. $20,000 × 2.5 (150 percent increase) = $50,000
3. $180,000 × 2.1 (110 percent increase) = $378,000
4. $500 × 1.3 (30 percent increase) = $650
5. $76,000 + $50,000 + $378,000 + $650 = $504,650
6. $121,000 + $15,000 = $136,000
7. $504,650 − $136,000 = $368,650
8. yes

Activity 19

1. −3%
2. 6%
3. 3%
4. decreased
5. 4%
6. 3%
7. 0.03
8. $12
9. $412
10. $416
11. $150
12. $692
13. $114
14. $186
15. No, you would be about $13 short.

Activity 20

1. 405
2. 3,645
3. 4,050; 13,550
4. 3,645; 365; 3,280; 17,195
5. 3,280; 328; 2,952; 20,475
6. 2,952; 295; 2,657; 23,427
7. 2,657; 266; 2,391; 26,084
8. 2,391; 239; 2,152; 28,475
9. $2,000
10. $250,000
11. $41,667

Copyright © by The McGraw-Hill Companies, Inc.

ANSWER KEY

Activity 21

1. about 25%
2. Your purchasing power would be decreased 25 percent at the end of the year.
3. You may not purchase certain items because inflation will erode your purchasing power.
4. 25%
5. Their purchasing power would decrease.
6. 1990–1991
7. They rose for a couple years, leveled off, and then dropped.
8. 1993–1995
9. tightening of the money supply

Activity 22

1. $.88; $.02; $.02
2. 3.75 riyals; 1.79 euros; 7.97 renminbi
3. 15,830 escudos
4. $.60
5. $14
6. $2,312.50
7. $2.50
8. $35.20
9. Chile, Japan, and Portugal

Activity 23

1. 9.1%
2. 7.0%
3. 4.7%
4. They are getting smaller.
5. Bartered goods are out of the government's taxing reach, so no revenues are collected.
6. Almost 180%
7. About 15%
8. Increasing revenue and/or decreasing spending, so that obligations can be met.

Activity 24

1. 1,170
2. 11
3. 57
4. 1
5. 886
6. 125
7. 13
8. 10
9. 17
10. 256
11. 393,000
12. 11,500
13. 1,000,000
14. 5,300
15. 328,000
16. 2,300,000
17. 2,400
18. 87,000
19. 104,000
20. 5,600,000
21. $133
22. $336
23. $1,045
24. $17,544
25. $5,300
26. $370
27. $18,400
28. $185
29. $8,700
30. $6,118
31. $21,875

Copyright © by The McGraw-Hill Companies, Inc.

32. United States, France, Japan

33. United States, France, Japan

34. Afghanistan, Cambodia, Madagascar

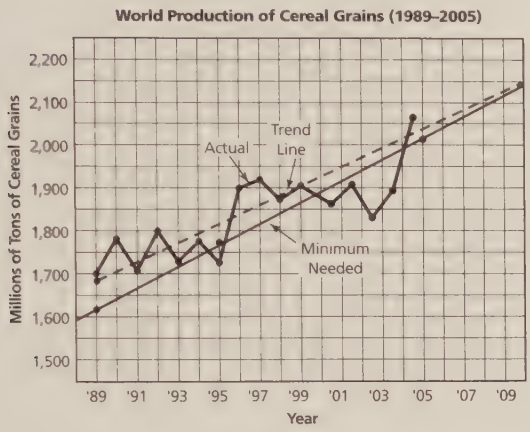
35. Afghanistan, Cambodia, Madagascar

36. Afghanistan, Cambodia, Madagascar, Gabon

37. United States, France, Japan

Activity 25

1.



2. **a.** 1,622.54

b. 1,762.04

c. 1,907.43

d. 2,024

3. See graph in Answer 1 above.

4. 2010; that's where the two lines cross

5. Either the world production must increase or demand must decrease by slowing the increase in population.

Activity 26

1. 32.9%

2. −0.8%

3. Germany

4. The United States

5. November, 1998, to February, 1999

6. August to November, 1998, and May to August, 1999

7. none

8. none

9. February to May, 1999

Copyright © by The McGraw-Hill Companies, Inc.

Glencoe Social Studies

Making a World of Difference

The McGraw-Hill Companies

ISBN: 978-0-07-878061-5
MHID: 0-07-878061-6

www.glencoe.com

Mc Graw Hill Glencoe

P9-AQL-335